

REMARKS

This is in response to the Office Action mailed October 6, 2003, in which the Examiner withdrew claims 3, 6, 9, 12-16, 19 and 21 from consideration and rejected claims 1, 2, 4, 5, 7, 8, 10, 11, 17, 18, 20, 22 and 23. With this Amendment, Applicant has made changes to the written description and claims 1, 7 and 17. Reconsideration of the application as amended is respectfully requested.

In response to an election requirement in the Office Action mailed June 25, 2003, Applicant elected to prosecute the species corresponding to FIG. 4 and identified claims 1-5, 7-11, 17, 18, and 20-23 as being readable thereon. In Section 1 of the Office Action, the Examiner revised the restriction and identified four species: the pole structure of FIG. 4 with a helical coil structure; the pole structure of FIG. 5 with a helical coil structure; the pole structure of FIG. 4 with a double pancake coil structure; and the pole structure of FIG. 5 with a double pancake coil structure. The Examiner defined Applicant's species election as corresponding to FIG. 4 with a helical coil structure. The Examiner then withdrew claims 3, 6, 9, 12-16, 19 and 21 from further consideration as being drawn to a non-elected species. Applicant affirms the election of the pole structure of FIG. 4 with the helical coil structure.

In Section 2 of the Office Action, the Examiner objected to the drawings as failing to "adequately depict the nature of the flux flow in figures 4 and 5." Additionally, the Examiner found that the "important issue is how the flux interacts with the magnetic medium" and that "an overall flux flow should be depicted to provide adequate understanding of how the invention operates and is distinguished from the prior art."

Applicant believes that the objections are improper. In particular, Applicant submits that the drawings adequately depict the invention as claimed, thereby satisfying 37 C.F.R. §1.81 and

1.83. Additionally, Applicant submits that the drawings satisfy 37 C.F.R. §1.84. Clarification of the objections and the grounds on which they are based is respectfully requested.

In Section 3 of the Office Action, the Examiner rejected claims 1, 2, 4, 5, 7, 8, 10, 11, 17, 18, 20, 22 and 23 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. In particular, the Examiner found that the depiction of a magnetization vector 198 in FIG. 4 (perpendicular writing element) and FIG. 5 (longitudinal writing element) was "inadequate to establish the flux interaction between a read/write element of the invention and a magnetic medium" The Examiner also found the overall flux flow in the system to be unclear and that such information is necessary "to show how the inventive read/write head operates and avoids unwanted fringing effects or similar such potential problems."

Applicant respectfully disagrees with the Examiner's findings and believes that the present application is sufficiently enabling to practice the invention. Applicant submits that FIGS. 4 and 5 sufficiently describe the subject matter of the rejected claims in such a way as to enable one skilled in the art to make/use the invention. Although there are structural differences between the writing element of the present invention and those of the prior art, the perpendicular and longitudinal writing element embodiments of the present invention perform data recording operations at the pole tip(s) of the writing element in substantially the same manner as writing elements of the prior art. As understood by those skilled in the art, such perpendicular and longitudinal recording operations involve setting the magnetic domains of the hard magnetic layer of the recording medium in the desired vertical or horizontal direction using the magnetic field extending from the pole tip(s) or magnetic domains at the pole tip(s), of the writing element. The magnetic domains (magnetic vectors 198 in FIG. 4) at the pole

tip of a perpendicular writing element are generally oriented vertically due to the presence of the soft magnetic layer in the recording medium, in accordance with principles of magnetism that are understood by those skilled in the art and explained with reference to FIG. 2 in the present application. The magnetic domains in the writer and auxiliary pole tips of the longitudinal writing element are oriented substantially horizontally, and the fringing of the magnetic field therebetween extends through the hard magnetic layer of the recording medium to set the orientation of the magnetic domains located therein, as explained in the present application at page 8, lines 19-26 and illustrated by magnetic domains (vectors) 198 in FIG. 5.

One structural difference between the writing elements of the present invention and those of the prior art is the lack of a return pole that forms a return path to conduct the magnetic signals back to the writer pole at the back gap region [page 11, lines 3-20]. This lack of a magnetically conductive return path results in reduced efficiency in terms of the intensity of the magnetic flux that is generated at the pole tip(s) of the writer element in response to magnetic signals generated by the conducting coil. This is because the magnetic field from the writer pole tip is only guided and focused by the magnetic material that is in close proximity thereto, such as the soft magnetic layer of the recording medium for the perpendicular writing element and the auxiliary pole of the longitudinal writing element. Outside of those magnetic elements, the magnetic field or flux is allowed to freely disperse rather than conduct back to the writer pole through a return path. Even though portions of the magnetic field (magnetic flux) generated at the writer pole tip may reach the writer pole at the back gap region through non-conductive means, the amount of magnetic flux that is received by the writer pole is substantially less than the amount of magnetic flux that would be received through conduction of the

magnetic flux through a traditional magnetically conductive return path. Additional portions of the magnetic field generated at the writer pole tip can travel through the soft magnetic layer of the recording medium and into the air, or into the magnetic shields of the read element, for example.

Applicant submits that it is unnecessary to amend FIGS. 4 and 5 of the present application to depict the magnetic field that is generated by the writing pole since it is substantially similar to that generated by prior art writing elements to record data to the magnetic recording medium. As a result, those skilled in the art, who have an understanding of perpendicular and longitudinal recording practices as well as basic principles of magnetism, do not require an illustration depicting the magnetic field lines that are generated during such a recording operation by the perpendicular and longitudinal writing element embodiments of the present invention. Therefore, Applicant submits that the present application constitutes enabling disclosure for those skilled in the art to make and use the invention, and requests that the rejections be withdrawn.

In Section 5 of the Office Action, the Examiner rejected claims 1, 4, 7, 10, 11, 17, 18, 22 and 23 under 35 U.S.C. §102(b) as being anticipated by Tanaka et al. (U.S. Patent No. 6,128,166). Applicant respectfully disagrees with the Examiner's assessment of the cited reference.

In particular, Tanaka et al. fail to provide any disclosure that the magnetic recording/reproducing system of FIG. 7 lacks a return path through which magnetic signals are conducted to the cited write pole 26 at a back gap region, as is described in independent claims 1, 7 and 17 of the present application. Additionally, FIG. 7 is a simplified cross-sectional view of the system of Tanaka et al. and, therefore, does not depict the entire structure of the system. Accordingly, it can not be known whether a return path that operates to conduct

magnetic signals to the write pole 26 at the back gap region exists in the magnetic recording/reproducing system of FIG. 7. For example, a different cross-section of the magnetic recording/reproducing system of Tanaka et al. would likely show that one of the shields 23 operates as such a return path. Therefore, Applicant submits that without any explicit description that the magnetic recording/reproducing system of FIG. 7 lacks a magnetically conductive return path, the cited reference can not provide enabling disclosure of such a writing element. Accordingly, Applicant submits that Tanaka et al. fail to provide enabling disclosure of the write elements of the rejected claims. Therefore, Applicant submits that claims 1, 4, 5, 7, 10, 11, 17, 18, 22 and 23 are not anticipated by Tanaka et al. and requests that the rejections be withdrawn.

In Section 7 of the Office Action, the Examiner rejected claims 2, 8 and 20 under 35 U.S.C. §103(a) as being unpatentable over Tanaka et al. in view of Cohen et al. (U.S. Patent NO. 5,703,740). The Examiner identified Tanaka et al. as failing to disclose a helical coil arrangement, but found such a coil arrangement to be disclosed in Cohen et al. The Examiner found that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the coil of Tanaka et al. take on a helical arrangement. Additionally, the Examiner found that one would have been motivated to make such an adjustment to Tanaka et al. in order to "provide an increased number of turns and to increase efficiency."

Applicant respectfully disagrees with the Examiner's assessment of the cited references. In particular, Applicant disagrees with the Examiner's finding of a motivation or suggestion to combine the references. The Federal Circuit has stated, "virtually all [inventions] are combinations of old elements." Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983). The Federal Circuit

has also found that rejecting patents solely by finding prior art corollaries for the claimed elements would permit an Examiner to use a claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention, which would be "an illogical and inappropriate process by which to determine patentability." Sensonics, Inc. v. Aerosonic Corp., 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996). Accordingly, even seemingly simple changes require a finding of a suggestion in the prior art to make the modification to avoid the improper use of hindsight. In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Tanaka et al. fail to provide any suggestion of a need for the helical coil arrangement of Cohen et al. or one having an increased number of turns or increased efficiency. Additionally, there is no evidence that the coil arrangement of Cohen et al. would result in an improvement over that disclosed in Tanaka et al. As a result, the Examiner must rely upon an Applicant's disclosure to provide the suggestion or motivation for the combination and to discern the "obviousness" of the present invention. Such use of hindsight is improper. In re Lee, 61 USPQ2d 1430 (Fed. Cir. 2002) ("It is improper, in determining whether a person of ordinary skill in the art would have been led to this combination of references, simply to '[use] that which the inventor taught against its teacher.'") (quoting W.L. Gore v. Garlock, Inc., 220 USPQ 303, 312-13 (Fed. Cir. 1983)).

Accordingly, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness against claims 2, 8 and 20, and request that the rejections be withdrawn. Additionally, Applicant submits that claims 2, 8 and 20 are allowable as being dependent from base claims 1, 7 and 17, respectively, which are believed to be allowable for the reasons discussed above.

In view of the above comments and remarks, it is believed that the present application is in condition for allowance. Consideration and favorable action is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

Brian D. Kaul, Reg. No. 41,885
Suite 1600 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

BDK/djb